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Higgs self-coupling measurement at the ILC at 550 GeV

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The Higgs mechanism is essential for the success of the Standard Model (SM) and can be experimentally verified with a determination of the Higgs self-coupling. As the simplest model of a Higgs potential, the SM provides a clear prediction of the Higgs self-coupling in terms of the Higgs mass and the vacuum expectation value. Any deviations would indicate physics beyond the SM and help guide extended Higgs models. At large enough centre-of-mass energies, double-Higgs production provides tree-level sensitivity to the trilinear Higgs self-coupling. At 550 GeV the leading production mode in e^+e^- comes from di-Higgs strahlung with a small contribution from WW -fusion. The most up-to-date ILD projections are extrapolated based on a full simulation analysis from 2016 by incorporating expected improvements in flavour tagging and kinematic reconstructions for event selection. This contribution will present the ongoing re-analysis using the SGV simulation of the ILD detector concept on a full SM background, where improvements in reconstruction tools such as flavour tagging and kinematic reconstruction have been included in the analysis as well as introducing advanced machine learning techniques for the event selection.

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